

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

Timothy G. Offerle

Group Art Unit: 3683

Serial Number: 10/708,676

Examiner: Schwartz, Christopher P.

Filed: 03/18/2004

For: METHOD AND APPARATUS FOR MAINTAINING A TRAILER IN A
STRAIGHT POSITION RELATIVE TO THE VEHICLE

Attorney Docket No: 81095827 (FGT 1909 PA)

CORRECTED APPEAL BRIEF

ail Stop Appeal Brief – Patents
Commissioner for Patents
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The following Corrected Appeal Brief is submitted in response to the Notice of Appeal
dated February 28, 2006.

I. Real Party in Interest

The real party in interest in this matter is Ford Global Technologies, LLC, which is a wholly owned subsidiary of Ford Motor Company both in Dearborn, Michigan (hereinafter "Ford").

II. Related Appeals and Interferences

There are no other known appeals or interferences, which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of the Claims

Claims 1-35 stand rejected in the Final Office Action. A copy of the claims on appeal is attached as a Claims Appendix.

IV. Status of Amendments

There have been no amendments filed subsequent to the final rejection.

V. Summary of Claimed Subject Matter

The subject matter of Claim 1 is best described with respect to Figure 4 and the corresponding description beginning in paragraph [0078] of the present application. Claim 1 describes controlling a vehicle 10 with a trailer 160 through determining a straight position of the trailer 160 using a trailer position sensor, such as a reverse aid sensor 48 described in paragraph [0060], during forward motion of the vehicle 10 and controlling the vehicle 10 through, for example, applying a brake-steer to the vehicle 10, to maintain the trailer 160 in a straight position.

Claim 2 recites the trailer sensor includes a hitch sensor 174. This is described in paragraph [0083].

Claim 3 recites that the trailer sensor includes a reverse aid sensor 48. This is described in paragraph [0060].

Claim 4 recites that the trailer sensor further includes a locating plate 177 coupled to a trailer tongue 161. This is described in paragraph [0084].

Claim 5 recites that the locating plate 177 includes a locating hole 178 therethrough, the locating hole aligned with the tongue 161. This is also described in paragraph [0084].

Claim 6 recites that the trailer sensor includes a camera. This is described in paragraph [0100].

Claim 7 recites controlling the vehicle when the vehicle is moving in straight reversing direction. This is described in paragraph [0136].

Claim 8 recites that straight reversing is determined from a reverse signal and a steering wheel angle signal. This is described in paragraph [0137].

Claim 9 recites that generating a reverse direction signal corresponding to a reverse direction of the vehicle 10. This is described in paragraph [0136].

Claim 10 recites that generating a reverse direction signal includes generating a reverse direction from a shift lever. This is described in paragraph [0114].

Claim 11 recites that generating a reverse direction signal includes generating a reverse direction from a push button. This is also described in paragraph [0114].

Claim 12 recites that generating a reverse direction signal includes generating a reverse direction from a transmission controller 152. This is described in paragraph [0082].

Claim 13 recites that generating a reverse direction signal includes generating a reverse direction from a wheel speed sensor 20. This is described in paragraph [0114].

Claim 14 recites selecting a trailer direction from a manual input. This is described in paragraph [0125].

Claim 15 recites that the manual input includes a turn-signal lever. This is described in paragraph [0125].

Claim 16 recites that the controlling includes generating brake-steer. This is described in paragraph [0126].

Claim 17 recites a system for controlling an automotive vehicle 10 having a trailer 160 and a primary steering actuator 88 and a secondary steering actuator 66 generating a signal indicative of a desired trailer turn direction. The system also includes a reverse signal means 48 generating a reverse signal corresponding to a reverse direction of the vehicle 10, and a trailer position sensor generating a trailer position signal. The system further includes a controller 26 coupled to the secondary steering actuator 66, the reverse signal means, and the trailer position sensor. The controller 26 is programmed to brake-steer the vehicle 10 to maintain the vehicle 10 in the desired trailer turn direction. This is described in paragraphs [0060] and [0069].

Claim 18 recites that the secondary steering actuator 66 includes a turn signal actuator. This is described in paragraph [0069].

Claim 19 recites that the secondary steering actuator 66 includes a stalk. This is also described in paragraph [0069].

Claim 20 recites that the secondary steering actuator 66 includes a push button. This is

also described in paragraph [0069].

Claim 21 recites that the controller 26 is programmed to brake-steer the trailer brake system 164a-164b and vehicle 10. This is described in paragraphs [0072] and [0129].

Claim 22 recites that the controller 26 is programmed to brake-steer the vehicle brake system. This is also described in paragraphs [0072] and [0129].

Claim 23 recites that comprising a vehicle brake system, the controller 26 programmed to brake-steer the vehicle brake system. This is also described in paragraphs [0072] and [0129].

Claim 24 recites that the trailer position sensor includes determining the presence of a trailer 160 with a hitch sensor 174. This is also described in paragraph [0121].

Claim 25 recites that determining the presence of a trailer includes determining the presence of a trailer 160 with a reverse aid sensor 48. This is also described in paragraph [0121].

Claim 26 recites that determining the presence of a trailer includes determining the presence of a trailer 160 with an ultrasonic sensor. This is also described in paragraph [0121].

Claim 27 recites that determining the presence of a trailer includes determining the presence of a trailer 160 with a camera. This is also described in paragraph [0121].

Claim 28 recites that the means includes a shift lever. This is also described in paragraphs [0081] and [0114].

Claim 29 recites that the means includes a push button. This is also described in paragraphs [0067] and [0114].

Claim 30 recites that the means includes a transmission controller 152. This is also described in paragraphs [0081] and [0114].

Claim 31 recites that the means includes a wheel speed sensor 20. This is also described in paragraph [0114].

Claim 32 recites a method of aligning a trailer 160 and a vehicle 10 including determining a position of the trailer using a trailer sensor positioned on the vehicle and a locating plate 177 having a locating hole 178 located on the trailer 160; determining the position of the locating hole relative to the vehicle 10 when the vehicle 10 is reversing toward the trailer 160; and displaying an indication of the position of the locating hole 178 relative to the vehicle 10. This is also described in paragraph [0084].

Claim 33 recites that determining a position includes determining a position relative to a hitch of the vehicle. This is also described in paragraph [0084].

Claim 34 recites that the trailer sensor includes a hitch sensor 174. This is also described in paragraph [0083].

Claim 35 recites that the trailer sensor includes a reverse aid sensor 48. This is also described in paragraph [0060].

VI. Grounds of Rejection to be Reviewed on Appeal

The following issues are presented in this appeal:

Whether claims 1-12, 14, 15, and 32-35 are patentable under 35 U.S.C. §103(a) over *Mizusawa* (US Publication 2002/0145663) in view of *McGregor* (6,801,125).

Whether claim 13 is patentable under 35 U.S.C. §103(a) over *Mizusawa* in view of *McGregor* as applied to claim 9 and further in view of US publication to Thiede et al. (US Publication 2003/0111902).

Whether claims 17-31 are patentable under 35 U.S.C. §103(a) over *Mizusawa* in view of *McGregor* and *Gerum* (5747683).

VII. Argument

The Rejection of claims 1-12, 14, 15, and 32-35 under 35 U.S.C. §103(a) as being obvious over *Mizusawa* in view of *McGregor*.

Claim 1

Claim 1 is directed to a method of controlling a vehicle that includes determining a straight position of the trailer using a trailer sensor during forward motion of the vehicle and controlling the vehicle to maintain the trailer in the straight position.

Appellants respectfully submit that the *Mizusawa* reference does not teach or suggest either. The *Mizusawa* reference is merely a method for reversing of a vehicle to align the vehicle so that the hitch may be coupled to the vehicle. There is no teaching or suggestion for use in the *Mizusawa* reference for providing the image processing for straight ahead travel. Claim 1 specifically recites determining a straight position of the trailer using a trailer sensor during forward motion of the vehicle. The *Mizusawa* reference in turn, determines the position of the vehicle relative to the trailer and not of a straight position of the trailer. Also, this positioning is done in reverse motion, not forward motion, of the vehicle. The *Mizusawa* reference also does not control the vehicle to maintain the trailer in a straight position. The

Mizusawa reference is used before the trailer and the vehicle are coupled and therefore the vehicle cannot maintain the trailer in a straight position.

The *McGregor* reference is set forth for providing a sensor for determining “a straight position” of the trailer. The *McGregor* reference is also directed to a docking mode for a vehicle. That is, the docking mode is performed in reverse mode. The *McGregor* reference specifically applies to a rear wheel steering actuated vehicle. These specific limitations are set forth in independent claims 1 and 10 of the *McGregor* reference. The HD mode operates the rear steering actuator to maneuver the vehicle to bring the target location and the location of the vehicle into alignment. The *McGregor* reference does not teach or suggest the use in a forward direction to maintain the trailer in a straight-ahead mode. The Examiner points to Col. 1, lines 43-50, which specifically recites the docking mode. Appellants therefore respectfully request the Board to reverse the Examiner’s position with respect to claim 1 for at least this reason.

Further, the Examiner argues that cited but not applied references of *Gerum*, *Lee* (6,956,468), *Kimbrough* (5,579,228), *Funke* (2002/0107627), and *Deng* (6,838,979) show that hitch angle sensors are used to determine a straight position of the trailer. Generally, the Appellants reserve rights to address these references should they be cited against the present application. The Appellants note, however, that, like the *Mizusawa* reference, none of these references include the step of determining a straight position of a trailer. They merely appear to include angle measurements and the like for use in trailer hitching or jackknife prevention situations, rather than for a determination of a straight position of the trailer. Determining a straight position as claimed includes the further requirements of, for example, using a sensor for generating a profile of a straight position of the vehicle with respect to the trailer. (See Paragraph 128.)

Again, the Appellants respectfully request the Board to reverse the Examiner’s position with respect to claim 1 because there is no teaching or suggestion in the prior art for the proposed combination.

Claims 2-15

Claims 2-15 stand or fall together with claim 1.

Claim 32

Claim 32 recites determining a position of a trailer using a trailer sensor positioned on the vehicle and a locating plate having a locating hole located on the trailer. Claim 32 further recites determining the position of the locating hole relative to the vehicle when the vehicle is reversing toward the trailer and displaying an indication of the position of the locating hole relative to the vehicle. Appellants have reviewed both the *McGregor* reference and the *Mizusawa* reference. Although both of the references teach reversing, no teaching or suggestion is provided for a locating hole in a locating plate positioned on a trailer. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 32 as well.

Claims 33-35

Claims 33-35 stand or fall together with claim 32.

The Rejection of claim 13 under 35 U.S.C. §103(a) over *Mizusawa* in view of *McGregor* as applied to claim 9 and further in view of US publication to *Thiede et al.*

Claim 13

Claim 13 stands or falls together with claim 1.

The Rejection of claims 17-31 under 35 U.S.C. §103(a) as being obvious over *Mizusawa* in view of *McGregor* and *Gerum*.

Claim 17

Claim 17 recites a steering actuator generating a signal indicative of a desired trailer turn direction, reverse signal means generating a reverse signal corresponding to a reverse direction of the vehicle, a trailer position sensor generating a trailer position signal, and a controller programmed to brake-steer the vehicle to maintain the vehicle in the desired trailer turn

direction. As mentioned above, both the *McGregor* and *Mizusawa* references are used for docking the vehicle. Claim 17 has a vehicle and trailer that are coupled together. The *McGregor* and *Mizusawa* references teach disconnected vehicles so that the trailer and the vehicle may be brought together. It should also be noted that a secondary steering actuator is used to generate the signal indicative of a desired trailer direction. The second secondary steering actuator may comprise many things, including a turn signal actuator, or push button, or the like. That is, the direction of the trailer is taught to the control system. The *Gerum* reference does not teach or suggest this. The *Gerum* reference teaches using brakes to stabilize the vehicle to prevent jackknifing and the like. No secondary steering actuator is taught or suggested. Therefore, claim 17 is believed to be allowable since none of the references teach a secondary steering actuator. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 17 because the prior art does not teach or suggest all the elements of the claim.

Claims 18-31

Claims 18-31 stand or fall together with claim 17.

VIII. Claims Appendix

A copy of each of the claims involved in this appeal, namely Claims 1-35, is attached hereto as a Claims Appendix.

IX. Evidence Appendix

None.

X. Related Proceedings Appendix

None.

XI. Conclusion

For the foregoing reasons, the Appellants respectfully request that the Board direct the Examiner in charge of this examination to withdraw the rejections.

Please charge any fees required in the filing of this appeal to deposit account 06-1510
or, if there are insufficient funds, to use deposit account 06-1505.

Respectfully submitted,

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CLAIMS APPENDIX

1. A method of controlling a vehicle comprising:
determining a straight position of the trailer using a trailer sensor during forward motion of the vehicle; and
controlling the vehicle to maintain the trailer in the straight position.
2. A method as recited in claim 1 wherein the trailer sensor comprises a hitch sensor.
3. A method as recited in claim 1 wherein the trailer sensor comprises a reverse aid sensor.
4. A method as recited in claim 3 wherein the trailer sensor further comprises a locating plate coupled to a trailer tongue.
5. A method as recited in claim 4 wherein the locating plate comprises a locating hole therethrough, said locating hole aligned with said tongue.
6. A method as recited in claim 1 wherein the trailer sensor comprises a camera.
7. A method as recited in claim 1 wherein controlling the vehicle comprises performing the step of controlling the vehicle when the vehicle is moving in straight reversing direction.
8. A method as recited in claim 7 wherein straight reversing is determined from a reverse signal and a steering wheel angle signal.
9. A method as recited in claim 1 further comprising generating a reverse direction signal corresponding to a reverse direction of the vehicle.

10. A method as recited in claim 9 wherein generating a reverse direction signal comprises generating a reverse direction from a shift lever.

11. A method as recited in claim 9 wherein generating a reverse direction signal comprises generating a reverse direction from a push button.

12. A method as recited in claim 9 wherein generating a reverse direction signal comprises generating a reverse direction from a transmission controller.

13. A method as recited in claim 9 wherein generating a reverse direction signal comprises generating a reverse direction from a wheel speed sensor.

14. A method as recited in claim 9 further comprising selecting a trailer direction from a manual input.

15. A method as recited in claim 14 wherein the manual input comprises a turn-signal lever.

16. A method as recited in claim 1 wherein said controlling comprises generating brake-steer.

17. A system for controlling an automotive vehicle having a trailer and a primary steering actuator comprising:

a secondary steering actuator generating a signal indicative of a desired trailer turn direction;

reverse signal means generating a reverse signal corresponding to a reverse direction of the vehicle; a trailer position sensor generating a trailer position signal;

a controller coupled to the secondary steering actuator, the reverse signal means and the trailer position sensor, said controller programmed to brake-steer the vehicle to maintain the vehicle in the desired trailer turn direction.

18. A system as recited in claim 17 wherein the secondary steering actuator comprises a turn signal actuator.

19. A system as recited in claim 17 wherein the secondary steering actuator comprises a stalk.

20. A system as recited in claim 17 wherein the secondary steering actuator comprises a push button.

21. A system as recited in claim 17 further comprising a trailer brake system, said controller programmed to brake-steer the trailer brake system and vehicle.

22. A system as recited in claim 21 further comprising a vehicle brake system, said controller programmed to brake-steer the vehicle brake system.

23. A system as recited in claim 17 further comprising a vehicle brake system, said controller programmed to brake-steer the vehicle brake system.

24. A system as recited in claim 17 wherein the trailer position sensor comprises determining the presence of a trailer with a hitch sensor.

25. A method as recited in claim 17 wherein determining the presence of a trailer comprises determining the presence of a trailer with a reverse aid sensor.

26. A method as recited in claim 17 wherein determining the presence of a trailer comprises determining the presence of a trailer with an ultrasonic sensor.

27. A method as recited in claim 17 wherein determining the presence of a trailer comprises determining the presence of a trailer with a camera.

28. A system as recited in claim 17 wherein said means comprises a shift lever.

29. A system as recited in claim 17 wherein said means comprises a push button.

30. A system as recited in claim 17 wherein said means comprises a transmission controller.

31. A system as recited in claim 17 wherein said means comprises a wheel speed sensor.

32. A method of aligning a trailer and a vehicle comprising:
determining a position of the trailer using a trailer sensor positioned on the vehicle and a locating plate having a locating hole located on the trailer;
determining the position of the locating hole relative to the vehicle when the vehicle is reversing toward the trailer; and
displaying an indication of the position of the locating hole relative to the vehicle.

33. A method as recited in claim 32 wherein determining a position comprises determining a position relative to a hitch of the vehicle.

34. A method as recited in claim 32 wherein the trailer sensor comprises a hitch sensor.

35. A method as recited in claim 32 wherein the trailer sensor comprises a reverse aid sensor.